Name of Organization: Chester Township

Type of Organization: Municipality

Contact Information: Mr. James Meerman

Chester Township

19340 - 32nd Avenue

Conklin MI 49403

Phone: (616) 899 - 5544 **Extension:**

Fax: (616) 899 - 2937

E-Mail:

Project Title: Crockery Lake Constructed Wetlands Project

Project Category: Emerging Issues

Rank by Organization (if applicable): 0

Total Funding Requested ($): 47,500 **Project Duration:** 1 Years

Abstract:

Chester Township, located in Ottawa County, Michigan, is proposing to initiate a feasibility study for implementing an innovative, natural, waste treatment system which utilizes constructed wetlands for homes located around Crockery Lake. A constructed wetlands treatment system could eliminate the water quality and health concerns associated with on-site septic systems on the Crockery Lake shoreline. Septic systems, especially those located on shoreline property, can be significant contributors to non-point source water pollution. Even if systems are functioning properly, pollution can occur due to soil, water table, erosion, and other characteristics of shoreline areas. Crockery Lake, located entirely within Chester Township, is an area where shoreline septic systems are a concern. Crockery Lake has 116 homes served by septic systems along the lakeshore. The United States Soil Conservation Service's "Soil Survey of Ottawa County, Michigan", shows seven soil types surrounding Crockery Lake. Of the seven, six are rated as having a "severe" limitation for use as a septic system disposal field due to rapidly permeable sand, high water tables, saturation in wet weather, slopes of more than 10%, and/or potential flood hazards. Current pollution concerns and the potential for future problems has required the identification of alternative methods of waste treatment suitable for Crockery Lake. This proposal would allow for the determination of the most ecologically beneficial and cost-effective method of constructed wetlands wastewater treatment. Once the most feasible alternative is identified, efforts will begin on the next phase of project development and construction. Additionally, the success of this project could serve as a model for other communities within the Lake Michigan Basin looking for methods of reducing non-point source pollution risks.

Geographic Areas Affected by the Project

States:

- ☐ Illinois
- ☐ Indiana
- ☒ Michigan
- ☐ Minnesota
- ☐ New York
- ☐ Pennsylvania
- ☐ Wisconsin
- ☐ Ohio

Lakes:

- ☐ Superior
- ☐ Huron
- ☒ Michigan
- ☐ Erie
- ☐ Ontario
- ☐ All Lakes

Geographic Initiatives:

☐ Greater Chicago ☐ NE Ohio ☐ NW Indiana ☐ SE Michigan ☐ Lake St. Clair

Primary Affected Area of Concern:

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area:

Other Affected Biodiversity Investment Areas:

Problem Statement:

Septic systems, especially those located on shoreline property, can be significant contributors to non-point source water pollution. Even if systems are functioning properly, pollution can occur due to soil, water table, erosion, and other characteristics of shoreline areas. Rapidly permeable soil can allow nutrients and bacteria to leach very quickly into the water table due to inadequate filtration. Subsurface flow then allows the nutrients and bacteria to enter the surface water. Soil that is saturated with water allows nutrients and biological contaminants to travel more freely, increasing the likelihood that wastes will leak into the surface water without being naturally filtered. Additionally, as shoreline erodes, the distance between the septic field and the shoreline decreases. This makes it easier for liquid wastes to reach the lake without adequate filtration.

Nutrients leaking from a shoreline septic system can play a major role in the eutrophication of lakes, leading to increased weed and algae growth. Excessive weed and algae growth, in turn, can detrimentally impact fish growth and survival as well as recreational opportunities. Additionally, poorly treated septic wastes entering surface water can carry disease-causing bacteria.

Crockery Lake, located in Chester Township, Ottawa County, Michigan (T9N, R13W, Sections 15&16) is an area where shoreline septic systems are a concern. Crockery Lake has 116 homes served by septic systems along the lakeshore. The United States Soil Conservation Service's "Soil Survey of Ottawa County, Michigan", shows seven soil types surrounding Crockery Lake. Of the seven, six are rated as having a "severe" limitation for use as a septic system disposal field due to rapidly permeable sand, high water tables, saturation in wet weather, slopes of more than 10%, and/or potential flood hazards. The lake has had continual problems with excess weed and algae growth, and a 1995 study determined Crockery Lake to have the characteristics of a eutrophic to near hyper-eutrophic system. Current pollution concerns and the potential for future problems has required the identification of alternative methods of waste treatment suitable for Crockery Lake.

Proposed Work Outcome:

Chester Township is proposing to initiate a feasibility study for implementing an innovative, natural, waste treatment system which utilizes constructed wetlands for homes located around Crockery Lake. A constructed wetlands treatment system could eliminate the water quality and health concerns associated with on-site septic systems on the Crockery Lake shoreline. Additionally, the success of this project could serve as a model for other communities within the Lake Michigan Basin looking for methods of reducing non-point source pollution risks.

A constructed wetlands can be used to treat a variety of waste streams including septage, industrial, stormwater, and

leachate (landfill). The advantages of a natural treatment process are as follows: lower construction, operating, and maintenance costs; chemical-free treatment; aesthetically pleasing treatment area; and high-quality treated water. A typical constructed wetland consists of a lined rock bed which is planted with a variety of scientifically chosen plant species. Wastewater flowing into the cell is treated through biochemical processes facilitated by plants and microorganisms within the wetland. This type of treatment system has the potential to reduce the nutrient and bacteria levels of discharged wastewater as compared to conventional systems. Additionally, the potential for lower long-term operating costs associated with a constructed wetlands system may make residents more likely to support a new waste treatment system that is proactive in addressing pollution concerns.

The purpose of the feasibility study is to investigate the most cost effective wetlands treatment method for Crockery Lake. An analysis of existing conditions, current problems, and site characteristics will occur. The site conditions will be investigated to determine soil texture and structure, soil hydraulic loading rate, seasonal high water table, and other limitations that will effect the use of a surface or subsurface disposal system. Physical concerns such as soils, topography, flood plain, and wetlands will also be reviewed to determine the effect that they may have on the selection of treatment system alternatives.

A time schedule for design, construction, and startup of the waste facility will be determined. Cost estimates for design, construction, operation, maintenance, and system evaluation will be prepared. After the feasibility study is completed, a report will be prepared which will discuss the results of the investigation and make a recommendation regarding the most cost-effective constructed wetlands treatment alternative. A conceptual layout of the proposed system - including approximate size - will be prepared. The conclusions and recommendations of the feasibility study will serve as a guide for the next phase of project development and construction.

Project Milestones:	**Dates:**
Start ASAP after funding is awarded	/
	/
	/
	/
	/
	/
	/
Project End	/

☐ Project Addresses Environmental Justice

If So, Description of How:

☐ Project Addresses Education/Outreach

If So, Description of How:

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	0	0
Fringe:	0	0
Travel:	0	0
Equipment:	0	0
Supplies:	0	0
Contracts:	47,500	2,500
Construction:	0	0
Other:	0	0
Total Direct Costs:	47,500	2,500
Indirect Costs:	0	0
Total:	47,500	2,500
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

Description of Collaboration/Community Based Support: